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## ***Claims***

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1. A process for removal of impurities from Nitric Oxide gas, for a research, industrial, semiconductors, medical, and analytical application, comprising: (a) providing a mixture of Nitric Oxide and its common impurities, (b) passing this gaseous mixture through a first filter composed by a mixture of hydroxides of alkali and earth alkali metals, (c) passing the mixture through a second filter system, (d) collecting the purified gas in a sealed delivery tank.

2. The process for removal of impurities according to claim 1, further comprising: maintaining the temperature of said first filter between 50 and 298 degrees Kelvin.

3. The process for removal of light impurities according to claim 2, further comprising: maintaining a pressure between 0.1 and 1000 atmospheres inside said delivery tank.

4. The process for removal of impurities according to claim 1, further comprising: retaining impurities in said first filter and in said second filter.

5. The process for removal of impurities according to claim 1, wherein the impurities are selected from a group comprising nitrogen dioxide ( $\text{NO}_2$ ), sulfur dioxide ( $\text{SO}_2$ ), sulfur trioxide ( $\text{SO}_3$ ), methane ( $\text{CH}_4$ ), oxygen ( $\text{O}_2$ ), carbon monoxide ( $\text{CO}$ ), and carbon dioxide ( $\text{CO}_2$ ), ozone ( $\text{O}_3$ ), water ( $\text{H}_2\text{O}$ ), ammonia ( $\text{NH}_3$ ), nitrous oxide ( $\text{N}_2\text{O}$ ) and volatile hydrocarbons.

6. The process for removal of impurities according to claim 1 where the mixture of hydroxides of alkali and earth alkali metal inside said filter 1 contains ASCARITE (registered trademark).

7. The process for removal of impurities from nitric oxide according to claim 1 where the mixture of hydroxides of alkali and earth alkali metals contains sodium hydroxide.

8. The process for removal of impurities from nitric oxide according to claim 1 where the mixture of hydroxides of

alkali and earth alkali metals contains anyone of the following compounds: sodium hydroxide, barium hydroxide, calcium hydroxide, lithium hydroxide, magnesium hydroxide, potassium hydroxide, strontium hydroxide, cesium hydroxide, francium hydroxide, and silica dioxide.

9. The process for nitric oxide purification according to claim 1, wherein said mixture of hydroxides of alkali and earth alkali metals is replaced upon depletion.

10. The process for nitric oxide purification according to claim 1, wherein said second filter contains a molecular sieve.

11. The process for nitric oxide purification according to claim 1, wherein said second filter is regenerated by flushing a dry gas and by heat.

12. The process for nitric oxide purification according to claim 1, wherein said nitric oxide conveyed to said delivery tank has a percentage of impurities between 0 % and 1 %.

14. An apparatus for removing impurities from a nitric

oxide comprising: (a) a tank of impure nitric oxide, said tank having a first end and a second end; (b) a first inert tubing system connecting said first end of said tank to a first filter-pack, (c) a needle valve to regulate the gas flow through the filtering system, (d) a first filter-pack, (e) a second inert tubing system connecting said filter-pack to a second filter-pack, (f) a second filter-pack, (g) a third inert tubing system delivering the purified nitric oxide to a delivery tank, (h) a delivery tank.

15. The apparatus for removing impurities from a nitric oxide gas according to claim 14, further comprising: a refrigeration unit integral with or separate from said first filter in order to maintain said first filter at a temperature between 50 and 298 degrees Kelvin.

16. The apparatus for removing impurities from a nitric oxide gas according to claim 14, comprising a vacuum pump.

17. The apparatus for removing impurities from a nitric oxide gas according to claim 14, wherein said second filter pack is a molecular sieve.

18. The apparatus for nitric oxide purification, according

to claim 14, wherein said first filter comprises silica dioxide supporting a hydroxide of an alkali or earth alkali metal.

19. The apparatus for removal of impurities according to claim 14, further comprising a tubing system internally coated with an inert material to avoid any reaction between the gas mixture and its internal surface. Said tubing system connecting all the elements of the apparatus.

20. An apparatus for filtering out impurities from nitric oxide comprising (a) a support of silica dioxide, (b) at least one hydroxide of alkali or earth alkali metals, (c) a box having inert interior surfaces and two openings, (d) a cooling system to cool down the temperature of the impure NO flow, (e) a metal filter-net to ease the deposition of the impurities.